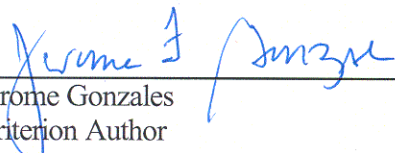
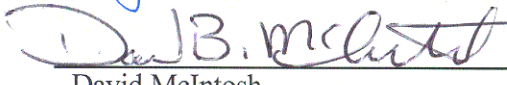
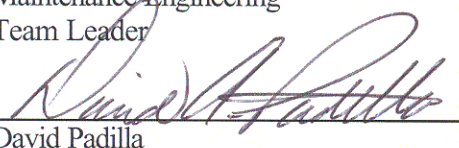
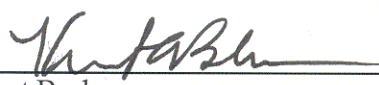
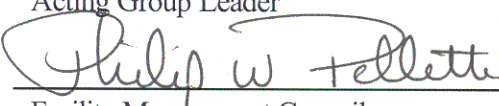


CRITERION 302

UTILITY TIE-INS

SIGNATURES

| | | | |
|--|-------------------------|-------------------------|---------------------------------|
|  Jerome Gonzales Criterion Author | <u>12/10/02</u> Date | <u>FWO-UI</u> Group | <u>665-2612</u> Phone Number |
|  David McIntosh Maintenance Engineering Team Leader | <u>12-10-02</u> Date | <u>FWO-SEM</u> Group | <u>667-3616</u> Phone Number |
|  David Padilla Utilities and Infrastructure | <u>12/10/02</u> Date | <u>FWO-UI</u> Group | <u>665-0106</u> Phone Number |
|  Kurt Beckman Acting Group Leader | <u>12/10/02</u> Date | <u>FWO-SEM</u> Group | <u>667-6261</u> Phone Number |
|  Philip W. Tellechea Facility Management Council Committee Chairperson | <u>12/6/02</u> Date | <u>FMC</u> Group | <u>665-4854</u> Phone Number |

RECORD OF REVISIONS

| Revision No. | Date | Description |
|---------------------|-------------|---|
| 0 | 12/10/98 | Initial Issue. Replaces 3.1-112, Rev. 1. |
| 1 | 12/06/02 | Includes DOE Lessons Learned from 1993 to present. This revision also reflects the addition of a Table of Contents, the use of basis statements in Sections 6, 7 and 9. Inclusion of formatting in Rev.3 of Writer's Guide Incorporation of comments due to Occurrence Report Number ALO-LA-LANL-ESHSUPT-2002-0002. |

TABLE OF CONTENTS

| | | |
|------|---|---|
| 1.0 | PURPOSE..... | 1 |
| 2.0 | SCOPE..... | 1 |
| 3.0 | ACRONYMS AND DEFINITIONS..... | 1 |
| 3.1 | Acronyms | 1 |
| 3.2 | Definitions | 2 |
| 4.0 | RESPONSIBILITIES | 3 |
| 4.1 | FWO-Systems, Engineering and Maintenance (SEM)..... | 3 |
| 4.2 | FWO-Utilities and Infrastructure (UI)..... | 3 |
| 4.3 | Facility Manager..... | 3 |
| 4.4 | Group Leader | 4 |
| 4.5 | SSS Utilities Department..... | 4 |
| 4.6 | Authority Having Jurisdiction (AHJ) - POCs for Mechanical and Electrical Chapter of LANL Engineering Manual..... | 4 |
| 5.0 | PRECAUTIONS AND LIMITATIONS | 4 |
| 5.1 | Precautions | 4 |
| 5.2 | Limitations | 4 |
| 6.0 | REQUIREMENTS | 5 |
| 6.1 | Operations Requirements | 5 |
| 6.2 | Maintenance Requirements | 7 |
| 7.0 | RECOMMENDATIONS AND GOOD PRACTICES | 7 |
| 7.1 | Operations Recommendations | 7 |
| 7.2 | Maintenance Recommendations | 7 |
| 8.0 | GUIDANCE | 7 |
| 8.1 | Operations Guidance | 7 |
| 8.2 | Maintenance Guidance | 7 |
| 9.0 | REQUIRED DOCUMENTATION..... | 8 |
| 9.1 | REQUIRED LANL Documents..... | 8 |
| 10.0 | REFERENCES | 9 |
| 11.0 | APPENDICES | 9 |

CRITERION 302

UTILITY TIE-INS

1.0 PURPOSE

The purpose of this Criterion is to establish the minimum requirements and best practices for Utility Tie-Ins at LANL and to ensure that the owner of the utility system, FWO-UI, maintains control of all utility tie-ins. This document addresses the requirements of LIR 230-05-01(Ref 10.1), "Operations and Maintenance Manual."

Implementation of these requirements and recommendations satisfies DOE Order 430.1A (Ref. 10.2), "Life Cycle Asset Management," Attachment 2 "Contractor Requirements Document," Paragraph 2, Sections A through C, which in part require UC to "...maintain physical assets in a condition suitable for their intended purpose" and employ "preventive, predictive, and corrective maintenance to ensure physical asset availability for planned use and/or proper disposition." Compliance with DOE Order 430.1A is required by Appendix G of the UC Contract.

2.0 SCOPE

The scope of this Criterion applies to utilities supplying a building or structure (electric system [$>600\text{VAC}$], natural gas, water, sanitary wastewater, and steam systems) to the point of delivery, unless otherwise defined in a memorandum of understanding (MOU). This Criterion does not address corrective maintenance actions required to repair or replace equipment. The scope of this Criterion does not apply to telecommunications tie-ins. If a telecommunications tie-in is necessary contact the LANL Computer, Communications and Networking Telecommunications Group (CNN-4) customer service representative.

3.0 ACRONYMS AND DEFINITIONS

3.1 Acronyms

| | |
|------------|-------------------------------------|
| AHJ | Authority Having Jurisdiction |
| CFR | Code of Federal Regulations |
| DOE | Department of Energy |
| LIG | Laboratory Implementing Guidance |
| LIR | Laboratory Implementing Requirement |

| | |
|------------------|--|
| LPR | Laboratory Performance Requirement |
| O&M | Operations and Maintenance |
| PPE | Personal Protective Equipment |
| PP&PE | Personal Property and Programmatic Equipment |
| RP&IE | Real Property and Installed Equipment |
| SSC | Structures, Systems, and Components |
| SSS | LANLs Support Services Subcontractor |
| UC | University of California |
| UI | FWO-Utilities and Infrastructure Group |

3.2 Definitions

Contractor(s).

Person or business who contracts to perform light or heavy construction for LANL.

Point of Delivery.

A. Water.

- **Potable:** Up to and including the billing meter inside the building. If there is no billing meter or it is located outside of the building, the interface is the exterior building wall.
- **Fire Protection:** Base of fire protection riser.

B. Wastewater. Building wall.

C. Gas. Up to and including the final service pressure reduction valve (gas regulator) serving the building(s).

D. Steam/Condensate. Up to and including high pressure steam trap piping and steam isolation valve upstream of the steam pressure reducing valves. First pressure reducing valves shall be less than five feet from inside of building wall where the steam line enters.

E. Electrical. Electrical utility system and termination points for the most common service configurations are as follows:

- **Pad Mounted Transformer:** The 13.8kV distribution system and the pad mounted transformer. The point of delivery terminates at the low voltage (480, 240, 208 volts) terminals of the pad mounted transformer which is located outside the building.
- **Secondary Unit Substation:** The low voltage (480, 240, 208 volts) terminals of the unit substation transformer. Unit substation may be outside or inside the building.

- **Overhead Service:** The electric system terminates at the building service entrance weather head.

4.0 RESPONSIBILITIES

4.1 FWO-Systems, Engineering and Maintenance (SEM)

- 4.1.1** FWO-SEM is responsible for the administrative content of this Criterion and monitoring the applicability and the implementation status of this Criteria and either assisting the organizations that are not applying or meeting the implementation expectations contained herein or elevating their concerns to the director(s).

Basis: LIR 301-00-01.11; Issuing and Managing Laboratory Operations Implementation Requirements and Guidance, Section 5.4, OIC Implementation Requirements.

- 4.1.2** FWO-SEM shall provide technical assistance to support implementation of this Criterion.

4.2 FWO-Utilities and Infrastructure (UI)

- 4.2.1** FWO-UI has overall responsibility to support the Laboratory with reliable, safe, and cost effective utilities (gas, steam/condensate, electrical, water, and sanitary wastewater). FWO-UI is also responsible for the technical content of the listed requirements and guidance.

- 4.2.2** FWO-UI shall provide technical assistance to support implementation of this Criterion.

4.3 Facility Manager

- 4.3.1** Responsible for operations and maintenance of institutional, or Real Property and Installed Equipment (RP&IE) under their jurisdiction, in accordance with the requirements of this document.

- 4.3.2** Responsible for operations and maintenance of those Personal Property and Programmatic Equipment (PP&PE) systems and equipment addressed by this document that may be assigned to the FM in accordance with the FMU-specific Facility/Tenant Agreement.

4.4 Group Leader

4.4.1 Responsible for operations and maintenance of those Personal Property and Programmatic Equipment (PP&PE) systems and equipment addressed by this document that are under their jurisdiction

4.4.2 Responsible for system performance analysis and subsequent replacement or refurbishment of assigned PP&PE.

4.5 SSS Utilities Department

4.5.1 SSS Utilities Department is responsible for ensuring that appropriate SSS personnel are trained and certified to perform the work.

4.6 Authority Having Jurisdiction (AHJ) - POCs for Mechanical and Electrical Chapter of LANL Engineering Manual

The AHJ is responsible for providing a decision on a specific technical question regarding this criterion.

5.0 PRECAUTIONS AND LIMITATIONS**5.1 Precautions**

This section is not intended to identify all applicable precautions necessary for implementation of this Criterion. A compilation of all applicable precautions shall be contained in the implementing procedure(s) or work control authorization documents. The following precautions are intended only to assist the author of a procedure or work control document in the identification of hazards/precautions that may not be immediately obvious.

5.2 Limitations

The intent of this Criterion is to identify the minimum generic requirements and recommendations for SSC operation and maintenance across the Laboratory. Each user is responsible for the identification and implementation of additional facility specific requirements and recommendations based on their authorization basis and unique equipment and conditions, (e.g., equipment history, manufacturer warranties, operating environment, vendor O&M requirements and guidance, etc.).

Nuclear facilities and moderate to high hazard non-nuclear facilities will typically have additional facility-specific requirements beyond those presented in this Criterion. Nuclear facilities shall implement the requirements of DOE Order 4330.4B

(Ref. 10.3) as the minimum programmatic requirements for a maintenance program. Additional requirements and recommendations for SSC operation and maintenance may be necessary to fully comply with the current DOE Order or CFR identified above.

6.0 REQUIREMENTS

Minimum requirements that Criterion users shall follow are specified in this section. Requested variances to these requirements shall be prepared and submitted to FWO-SEM in accordance with LIR 301-00-02 (Ref. 10.4), "Variances and Exceptions to Laboratory Operations Requirements," for review and approval. The Criterion users are responsible for analysis of operational performance and SSC replacement or refurbishment based on this analysis. Laws, codes, contractual requirements, engineering judgment, safety matters, and operations and maintenance experience drive the requirements contained in this section.

6.1 Operations Requirements

6.1.1 Materials

The contractor provides all materials required for the utility tie-in, and performs the necessary excavation and work required to prepare the area for the tie-in accordance with the Facility Engineering Manual. The SSS Utilities Department furnishes the necessary special equipment, e.g., hot tapping machines, and makes all of the following tie-ins in accordance with the Facility Engineering Manual or construction drawings.

Basis: *LL-OH/OCS 2001-1 (Configuration of Worksite)*

- **Water Tie-Ins** - Connections to mains and service lines in potable, nonpotable, and fire protection systems.
- **Sanitary Wastewater Tie-Ins** - Connections to systems which include sanitary sewer lines, treatment plants, lift stations, treated effluent water, and manholes. Septic tanks are not included in FWO-UI's responsibilities.
- **Gas Tie-Ins** - Connections to mains and service lines.
- **Steam/Condensate Tie-Ins** - Connections to mains and service lines, including piping in steam pits, and steam plants.
- **Electrical Tie-Ins** - Connections to energized sources and lightning arresters on existing utility poles shall be made by the SSS. The SSS shall be contacted regarding tie-ins to an energized riser pole to the 13.8kV switchgear or transformer by the construction project manager.

Basis: 1996-LA-LANL-ESH7-0001 (Work Control)

6.1.2 Planned Utility Outage

Contractors and/or the SSS shall plan utility outages to minimize the impact on users whose facilities and equipment may be affected. Comply with the Operations and Maintenance Criterion 301, Planned Utility Outage. (Ref. 10.6)

Basis: Maintenance Criterion 301, Planned Utility Outage.

6.1.3 Disinfection

The contractor and/or the SSS shall disinfect water piping systems in accordance with the Facility Engineering Standard Construction Specifications, Section 15470, Disinfection of Water Piping.

Basis: Facility Engineering Standard Construction Specifications, Section 02516, Disinfection of Water Piping.

6.1.4 Pressure Testing

Prior to tie-in, the contractor shall pressure test piping systems in accordance with the Facility Engineering Standard Construction Specifications, Section 15992, Testing Piping Systems.

Basis: Facility Engineering Standard Construction Specifications, Section 15992, Testing Piping Systems.

6.1.5 Electrical Testing

The SSS shall perform shield continuity tests, insulation resistance tests, high potential tests on medium voltage service cables and test all alarms and controls on wastewater lift stations.

Basis: Y-2001-OR-BJCPORTS-0101 (Roles and Responsibilities)

6.1.6 Notification

PM Division, contractors, the SSS, Facility Managers, etc., are responsible for notifying FWO-UI of any proposed tie-in to the utility system. Notification should be as soon as possible in the process, preferably during design. FWO-UI will review drawings to ensure that the utility system has sufficient capacity and that the Facility Engineering Standards are followed.

Basis: Y-2001-OR-BJCPORTS-0101 (Roles and Responsibilities)

6.1.7 Inspection

The SSS or LANL Construction Inspector shall notify FWO-UI at least 72 hours in advance to inspect the utility tie-in. FWO-UI will ensure that the utility has been

properly tested, and materials furnished by the contractor and the tie-in are in accordance with the applicable Facility Engineering Standards.

- The SSS shall inspect the interior of all wastewater lines beyond the building wall with a video camera for piping integrity and proper construction.

Basis: Y-2001-OR-BJCPORTS-0101 (Roles and Responsibilities)

6.2 Maintenance Requirements

6.2.1 No requirements beyond those stated in Section 5.2, Limitations.

7.0 RECOMMENDATIONS AND GOOD PRACTICES

The information provided in this section is recommended based on acceptable industry practices and should be implemented by each user based on his/her unique application and operating history of the subject systems/equipment.

7.1 Operations Recommendations

7.1.1 Building Managers should check building systems that may be affected by the tie-in so that appropriate users are notified.

Basis: 2000-KO-SNL-NMFAC-0001 (Communication of Hazards)

7.2 Maintenance Recommendations

7.2.1 No recommendations beyond those stated in Section 5.2, Limitations.

8.0 GUIDANCE

8.1 Operations Guidance

8.1.1 No implementing guidance available.

8.2 Maintenance Guidance

8.2.1 No implementing guidance available.

9.0 REQUIRED DOCUMENTATION

Maintenance history shall be maintained by FWO-UI for utility tie-ins to include, as a minimum, the parameters listed in the Table 9-1 below:

Table 9-1 Documentation Parameters

| MAINTENANCE HISTORY DOCUMENTATION PARAMETERS | | | | |
|--|------|------|------|------|
| PARAMETER | ML 1 | ML 2 | ML 3 | ML 4 |
| Maintenance Activities | | | | |
| Repair / Adjustments | NA | NA | NA | NA |
| PM Activities | NA | NA | NA | NA |
| Equipment Problems | | | | |
| Failure Dates | NA | NA | NA | NA |
| Failure Root Cause | NA | NA | NA | NA |
| Inspection Results | | | | |
| Inspection Date | NA | NA | NA | NA |
| SSC Condition | NA | NA | NA | NA |
| Inspection and testing results for utility tie-ins shall be submitted to FWO-UI | | | | |

Basis: Documentation of the parameters listed in Table 9-1 above satisfies the requirements of LPR 230-07-00, Criteria 2, (Ref. 10.5) which states; "Maintenance activities, equipment problems, and inspection and test results are documented."

9.1 Required LANL Documents

Refer to the following LANL Engineering Manual and Construction Specifications for required documentation:

LANL Engineering Manual Sections:

II – Fire Protection

III – Civil

VI – Mechanical

VII – Electrical

LANL Construction Specifications:

02310 – Trenching

15140 – Potable Water Piping

15150 – Sanitary Waste and Vent Piping

15195 – Natural Gas Piping

15470 – Disinfection of Potable Water Piping

15525 – Steam & Condensate Piping

15992 – Testing of Piping Systems

16950 – Electrical Acceptance Testing

*LANL Construction inspectors, FMU representatives and SSS shall submit to FWO-UI the above marked results in accordance with requirements of the project drawings and specifications.

10.0 REFERENCES

The following references, and associated revisions, were used in the development of this document.

- 10.1** LIR 230-05-01.0, Operation and Maintenance Manual.
- 10.2** DOE O 430.1A, Attachment 2 “Contractor Requirements Document” (Paragraph 2, Sections A through C), a requirement of Appendix G of the UC Contract.
- 10.3** DOE Order 4330.4B, Maintenance Management Program, Section 3.4.9.
- 10.4** LIR 301-00-02.0, Variances and Exceptions to Laboratory Operation Requirements.
- 10.5** LPR 230-07-00, Maintenance History, Performance Criteria [2].
- 10.6** O&M Criterion 301 Rev. 0, Planned Utility Outage.

11.0 APPENDICES

None.